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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/934,175	08/21/2001	Robert L. Canella	4323US (MUEI-0543.00/US)	7405

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EXAMINER

KIELIN, ERIK J

ART UNIT

PAPER NUMBER

2813

DATE MAILED: 07/31/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.		Applicant(s)	
	09/934,175		CANELLA, ROBERT L.	
	Examiner		Art Unit	
	Erik Kielin		2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2002.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 and 24-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 21 November 2001 is: a) ☒ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

#### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of the invention of Group II, claims 9-23, in Paper No. 8 is acknowledged. Claims 1-8, and 24-41 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Drawings***

2. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 14 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claim 14 recites the limitation "said opposing surface" in line 3. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

7. Claims 9-12, 14-16, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by US 3,569,790 (**Jenik**).

Regarding claim 9, **Jenik** discloses a device for establishing electrical contact between a lead element 7, 7' (called "contact pins" col. 3, lines 25-26; Fig. 3) extending from an integrated circuit 6 (called also "micromodules" col. 1, lines 6-7) and a substrate 12 (called "circuit plate" col. 3, line 57) comprising,

a spring contact 11 including a base portion 13 (Fig. 4) and a contact portion 11', said contact portion comprising a resiliently compressible coil spring configured to bias against and electrically contact said lead element 7, 7' of said integrated circuit device 6; and

an aperture opening (not labeled in Fig. 3 and 4; col. 3, lines 63-65) onto one surface of said substrate 12 and extending a depth at least partially into said substrate, said aperture configured to receive and electrically contact said base portion 13 of said spring contact.

Regarding claim 10, see Figs. 3 and 4.

Art Unit: 2813

Regarding claims 11 and 15 a “layer of conductive material” or “volume of conductive filler material” **12a** (col. 3, line 65) is disposed on the interior wall of the aperture which is therefore necessarily “in” the aperture and electrically contacts the base portion **13** of the spring contact **11**. With further regard to claim 15, it is noted that the claims presently do not distinguish between the “conductive layer on the interior wall” and the “volume of conductive filler.”

Regarding claims 12, 14, 16, and 18, the conductive material **12a** is electrically connected to conductive traces formed on said one surface and the opposing surface of said substrate (not labeled but shown as part of **12a**; Figs. 3-4).

8. Claims 9-12, 14-16, 18-22 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,229,320 B1 (**Haseyama** et al.).

Regarding claim 9, **Haseyama** discloses a device for establishing electrical contact between a lead element **28** (called “solder bumps” col. 10, line 38; Fig. 11) extending from an integrated circuit **25** (called “IC” col. 10, line 31) and a substrate which includes the parts labeled **23** (called “contact unit” col. 9, lines 23-24), **32** (called “test board” col. 6, line 1), and **36** (Fig 11; called “positioning plate” col. 11, line 32) comprising,

a spring contact **30** (called “contact pins” Figs. 6, 21A-21B, 23A) including a base portion **71, 72, 73** (Figs. 24A-24C) and a contact portion **63**, said contact portion **63** comprising a resiliently compressible coil spring configured to bias against and electrically contact said lead element **28** of said integrated circuit device **25** (col. 15, lines 32-53; col. 16, lines 17-25); and

an aperture **35** (called “through holes” col. 10, line 45; Fig. 11), **70** (called “through holes” col. 17, line 12; Figs. 24A-24C) opening onto one surface of said substrate **32** and extending a depth at least partially into said substrate **32**, said aperture **70** configured to receive and electrically contact said base portion **71, 72, 73** of said spring contact.

Regarding claim 10, see Figs. 11, 24A-24C which show that the aperture extends all of the way through the substrate **36, 23, and 32** for the purpose of making electrical connection between the integrated circuit device **25** and the test board **32**.

Regarding claims 11 and 15, a layer of conductive material or a volume of conductive filler **40** (Fig. 11; col. 10, lines 64-67), **70** (Figs. 24A-24C) is disposed on the interior wall of the aperture **35, 70** and is therefore necessarily “in” the aperture and electrically contacts the base portion **71, 72, 73** of the spring contact **30**.

Regarding claims 12, 14, 16, and 18, the conductive material **70** is electrically connected to conductive traces **70** formed on said one surface and the opposing surface of said substrate **32** (not separately labeled but shown as part of **70** in Figs. 24A-24C).

Regarding claim 19, the aperture **40, 70** includes a seat portion **38** (Fig. 11; called “positioning recesses” col. 10, lines 45-47) configured to receive said contact portion **63** of said spring contact, one end of said seat portion opening onto said one surface of said substrate **36**;

a retaining portion **31, 70** (Figs. 24A-24C) configured to receive the base portion **71, 72, 73** of the spring contact **30**, said retaining portion **31, 70** having a first end **31a** (Fig. 11, or as shown in Fig. 14B) connected to an opposing end of said seat portion **38** (or **53A** in Fig. 14B) and a second end **70** extending said depth into said substrate **36, 23, 32**. Note that Fig. 11 is shown in exploded view.

Regarding claim 20, the second end of said retaining portion **70**, opens onto an opposing surface of said substrate **36**, **23**, **32** as shown in Figs. 24A-24C.

Regarding claim 21, the seat portion may be conically shaped (col. 10, lines 45-47). As shown in Fig. 14B, the seat portion **53A** is cylindrically shaped and is integral with the elastic member **31** which is part of substrate **23**.

Regarding claim 22, the seat portion **38** (or **53A**) is configured to at least partially align said lead element 28 of said IC device **25**.

### ***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Haseyama** in view of Patent Application Publication US 2002/0075025 A1 (**Tanaka**).

The prior art of **Haseyama**, as explained above, discloses each of the claimed features except for indicating that the substrate has an “intermediate conductive plane,” which Examiner interprets to be exemplary shown in the instant Fig. 11, item **669**.

**Tanaka**, like **Haseyama**, teaches a semiconductor testing tool, and provides an “intermediate conductive plane,” (called “internal lead wires 8” in the Abstract), electrically connected to the conductive layer or conductive filler **7**, which beneficially reduces the number of structural elements of the test tool.

It would have been obvious for one of ordinary skill in the art, at the time of the invention to include “intermediate conductive plane,” as taught by **Tanaka**, in the substrate of **Haseyama** to beneficially reduce the number of structural elements, by providing embedded elements, as expressly taught by **Tanaka**.

11. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Haseyama** in view of JP 2000-123935 (**Kawaguchi**).

The prior art of **Haseyama**, as explained above, discloses each of the claimed features except for indicating that the coil spring has at least two coils for contacting the lead elements.

**Kawaguchi** teaches a similar integrated circuit test tool to **Haseyama** wherein coil springs **20** (Figs 1 and 2) are used to make electrical contact to the lead elements **11** (solder bumps or conductive balls) of an integrated circuit **10**, and states in pertinent part (in the machine language translation) “this invention aims at offer of the contact pin which does not start the defective continuity by the poor contact, and the socket using this contact pin, without generating damage, when ... a conductive ball is contacted” (paragraph [0006] ) and in solving the problem provides a contact pin having a contact section, “of the shape of a spiral by two or more number-of-turns sections of a coiled spring edge.”

It would have been obvious for one of ordinary skill in the art, at the time of the invention to use two or more coil turns as taught by **Kawaguchi** in the spring contact portion of **Haseyama** to prevent damage and provide better contact with the solder bumps, as expressly taught by **Kawaguchi**.



### *Conclusion*

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

JP 3-206681 (**Ikeda** et al.) teaches the benefits of providing a volume of conductive filler **6** (Fig. 4; called conductive rubber or resin) in the aperture and electrically contacting the spring contact **5** to ensure good electrical contact even in the presence of cracks in the metal liner portion **3a**. (See also the Abstract.)

US Patent Application 2001/0011898 A1 (**Haseyama** et al.) is a continuation of the Hasegawa reference applied above.

US 6,333,638 B1 (**Fusasawa** et al.) teaches an integrated circuit test tool employing spring contacts for electrical connection to solder balls (See Abstract and Fig. 50).

US Patent Application 2002/0060579 A1 (**Haseyama**) teaches an integrated circuit test tool employing spring contacts for electrical connection to solder balls. (See Abstract and all figures.)

US 6,341,962 B1 (**Sinclair**) teaches an integrated circuit test tool employing spring contacts for electrical connection to solder balls. (See Abstract and all figures.)

US 6,043,666 (**Kazama**) teaches an integrated circuit test tool employing spring contacts for electrical connection to solder balls. (See Abstract and all figures.)

US 6,249,440 B1 (**Affolter**) teaches a spring contact for a ball grid array (Fig. 4).

Art Unit: 2813

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erik Kielin whose telephone number is 703-306-5980. The examiner can normally be reached on 9:00 - 19:30 on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached at 703-306-2417. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

  
Erik Kielin

July 25, 2002